Intonation Contour of Combination of Indonesian Words in Interrogative Sentence with Yes or No Answer Spoken by Autistic Children

Abstract—Autistic children produce various utterances. Sometimes, they say sentence consisting of one word or more. This one word or more can be called sentence since it ends with final intonation. In Indonesian language, we have various final intonation such as (.), (!), and (?). One of sentences which is spoken by autistic children is interrogative sentence. One of interrogative sentences uttered by autistic children is sentence which requires short answers such as yes or no. The purpose of this paper was to describe intonation contour of combination of Indonesian Words of Interrogative sentence with yes or no answer spoken by children with autism. The data of this research is combination of words in Indonesian interrogative sentence. The resource of research data is utterance of children with autism. The researcher analyzed data by using equal method that is phonetic-articulatory method with basic technique of selecting certain element.

Keywords—intonation contour; combination of Indonesian words; interrogative sentence; autistic

I. INTRODUCTION

There are two kinds of interrogative sentence depending on the expected answer. The interrogative sentence is uttered by people who expect either yes answer or no answer. Traditionally, this sentence is called yes-no question. Yes-no question in Indonesian language is produced via one of three ways: (1) by using asker indicator apa with or without interrogative suffix –kah; (2) by using interrogative suffix –kah; and (3) by using intonation. Information question is a sentence where the asker expects information from person that he/she asks. This second type of interrogative sentence requires question words such as what, who, how much, when, etc. depending on the topic. Since these words seek for new information, it is logic that these words (both stand alone or come with other word) fulfill the name phrase of the related. Automatically, these question words confirm the existence of main pause group on intonation of such a sentence [1]

Yes-no question and information question have same meaning that is asking something but the answer expected by the speaker is different. Yes-no question requires shorter answer compared to that of information question. Information question requires more complete or longer answer. This sentence also provides complete answer in accordance with what is asked by the questioner. Therefore, there is something interesting from yes-no question words and information question words. The interesting thing is on the speaker. There are various intonation patterns among normal children and children with special needs. This variety can be seen from the intonation pattern which is uttered.

Intonation in Indonesian Language is very essential in differentiating meaning of each sentence, even on the basis of intonation pattern studies. One example is interrogative sentence. The intonation pattern which marks interrogative sentence is up-flat intonation [2] In Indonesian language, in order to be called meaningful sentence, the sentence must contain special marker, intonation. Intonation is what defines meaning of sentence and it defines sentence itself. Without intonation, the sentence will be flat and stiff. With intonation, the meaning of a sentence will be easier to be understood by the respondent.

Characterization of Indonesian language needs introduction of a hierarchy of four units of distinctive intonation. 1) intonation pattern (total), 2) Pause group, 3) Contour, both pre-contour and main contour (or primary contour), and 4) Intonation phoneme: pitch level, pressure and pause. Intonation is controlled by sub-component of intonation from phonologic components of grammar and is realized or explained on appearance level by items such as pitch, pressure, pause and the settings. This intonation can be broken down into smaller constituents such as pause group. The amount and spread of this pause group in a sentence depends on the structure of the sentence itself, on syntax component. Intonation has two function: (1) grammatical function and (2) emotional function. These two functions work together (in general the two functions do not avoid on their distribution in every utterance). The grammatical function is primary meanwhile the emotional function was secondary [1]

Every child has their own way to express what they think or feel. Autistic children also have their own way to express although sometimes they face difficulty. They have various ways to express such as babbling or saying excessive or unnecessary words when they
communicate with others. They have various utterance although some of those utterances are excessive or less meaningful [3]

Yes-no question utterance from autistic children is uttered with emotion that they feel. They utter in accordance with what they think and feel without influence from others. The meaning of what they ask can be different from or similar to the meaning of what normal children ask. This matter is in accordance with the situation and condition when they speak.

II. METHODS

The researchers collected the data by recording and noting utterance of children with autism. The data that was collected was utterance in the form of interrogative sentence in Indonesian language. The resource of research data is the utterance of children with autism. The object of this research was intonation contour of words in interrogative sentence. The researchers analyzed the data by using match method that is articulatory phonetic with basic technique of sorting certain element.

The method which was used in this research was linguistic research method which introduced by [4] in his book entitled “Metode dan Aneka Teknik Analisis Bahasa”, which is match method with speaking organ as determiner tool and with articulatory phonetic method. The determiner tools in match method is placed outside, free and is not the part of related language.

The methods which were used to collect the data were scrutinizing, speaking and observing. The data was collected by observing utterance of autistic children and talking to them. The object if this research is intonation contour of combination of words in interrogative sentence.

The scrutinizing method was conducted by using involvement in conversation, recording technique and noting technique. The data was collected by getting involved in communication or conversation with source of data. This technique was conducted by using interview with source of data to collect information which was needed by the researchers.

III. RESULTS AND DISCUSSION

The interrogative utterance of autistic children is in the form of words combination sentence. Words combination sentence means the sentence consists of two words or more with final intonation. [5] says that words combination sentence consists of two words.

The interrogative sentence which is elaborated in this article is interrogative sentence in the form of sentence consists of two words or more. This sentence is uttered by children because they need short answer, yes or no. The interrogative sentence in this discussion means sentence which is uttered by the speakers to ask something whether they need answer or not. In addition, this interrogative sentence ends with final intonation in the form of question mark (?).

Intonation pattern of interrogative sentence shown in the scale from 1 to 4. Low intonation is symbolized with 1. Medium intonation is symbolized with 2. High intonation is symbolized with 3. Very high intonation is symbolized with 4. [1] explains intonation patters with symbol 1, 2 and 3. Symbol 1 means low intonation, symbol 2 means medium intonation and symbol 3 means high intonation.

The rhetorical interrogative sentence which is uttered by autistic children does not require complete answer from the respondent. The sentence which is uttered by them comes from /simple utterance/. They say what they think. When they are asked back, they say that they do not really understand what they said.

Table 1. The interrogative sentence with yes or no answer

<table>
<thead>
<tr>
<th>Interrogative sentence</th>
<th>Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gak denger apa?</td>
<td>3 22 23t#</td>
</tr>
<tr>
<td>Bu lama gak?</td>
<td>2 22 3t#</td>
</tr>
<tr>
<td>Bu Ika ikut?</td>
<td>2 23 23t#</td>
</tr>
<tr>
<td>Masih ingat?</td>
<td>2- 2t#</td>
</tr>
<tr>
<td>Lapangan boleh?</td>
<td>2n 22 23t#</td>
</tr>
<tr>
<td>Ke mana, di situ?</td>
<td>2 23/ 2 23t#</td>
</tr>
</tbody>
</table>

The pattern of interrogative sentence with yes or no answer covers Gak denger apa which was symbolized by 3 22 23t#, Bu lama gak which was symbolized by 2 22 3t#, Bu Ika ikut which was symbolized by 2 23 23t#, Masih ingat which was symbolized by 2- 2t#, Lapangan boleh which was symbolized by 2n 22 23t#, and Ke mana, di situ which was symbolized by 2 23/ 2 23t#.

The above-mentioned sentence requires a yes or no answer (trans. Ya atau tidak). Yes, means justifying or affirming. Words do not mean reject or disagree. The word Yes is positive while the word no is negative. [6] says that the forms of “no” appear to be nonsystematic. They may manifest as “no”, “not” or “don’t” and were used interchangeably as they appear, to the language acquirers, to have no difference in meaning.

The data stated above was natural utterance of children with autism. They speak Indonesian language based on what they wanted to convey to others. Those utterances emerged naturally. The data was collected by giving stimulus. It means, the researchers were involved in conversation with those children. The communication between autistic children and researchers went naturally. It flowed in accordance with the topic. However, the researchers also found some utterances which were less appropriate. The researchers also found some answers which were not suitable for the questions. The researcher also found that it was little hard to understand some of those utterances since some of interrogative sentences which were uttered by those children were child’s /ocehan/ They said an interrogative sentence as they wanted without understanding what the meaning of their sentence and they did not really know what exactly they wanted. Those utterances were natural, they said what they wanted to ask to the respondents.

The difficulty in processing clause structure is relative but the difficulty depends on characteristics of...
grammar of a language. that Malay children tried to understand the use of structure of relative clause in wh-question word. The ability to understand the relative clause is linear with their age. The study also showed that children's maturity level influenced their language proficiency [7]

The following is the data of intonation pattern of words combination in interrogative sentence with yes or no answer which were uttered by children with autism. This intonation pattern was analyzed by using spectrogram and contour based on Pratt Program.

(1) Gak denger apa?
3 2 2 2 3t#

Figure 1. Spectrogram of Gak denger apa?

Spectrogram (1) shows the energy amount which was used to say Gak denger apa? In addition, it also showed line which was elaborated with dots which were connected to each other in straight or horizontal position. Below the dots, there was zigzag line. This line referred to slenderness which flowed up and down actively representing intensity which referred to the loudness of voice when the speaker said Gak denger apa?

Data (1) was shown in spectrogram (1) which was represented in visible part and total duration of 1.683787 second. Picture of Spectrogram (1) covers three parts. The first part is in the form of spectrogram which showed picture of black and with which were tight and loose. The soundwave showed the scale was -0.00871. The low soundwave was -0.1052 and the height of soundwave was 0.1022.

The second part covers two parts, pitch and intensity. Show pitch represented blue line which showed the frequency. This part showed that data (1) was uttered in frequency of 276.7 Hz at final intonation. Meanwhile at the high frequency, the frequency was 500 Hz. The lowest frequency was 75 Hz.

The third part is text grid which shows interrogative sentence on spectrogram in accordance with data (1). The part says interrogative sentence Gak denger apa? Text grid showed sentence based on soundwave at first part and second part.

In addition to spectrogram, there was also picture of intonation which went up and down. There was contour top in utterance Gak denger apa? The contour top was in word /gak/.

Figure 2. Contour of Gak denger apa?

Contour which went up and down was appearance of the data (1) which was shown in contour (2). There were two dots in intonation contour. These dots were primary contour and pre-contour. intonation contour in contour (2) of initial dot of contour was shown in 25.0 Hz. The top of contour dot was in dot of 366.3 Hz. The picture showed visible part and total duration of 1.683787 seconds. It means, sentence (1) was uttered for 1.683787 seconds.

(2) Bu lama gak?
2 2 2 3#

Figure 3. Spectrogram of Bu lama gak?

Figure of spectrogram (3) shows the energy which was used to say Bu lama gak? This picture also showed formant which was represented with dots which were connected to each other in straight or horizontal position. Below the dots, there was zigzag line. This line referred to slenderness which flowed up and down actively representing intensity which referred to the loudness of voice when the speaker said Bu lama gak?

Figure (3) showed utterance of Bu lama gak? Which was uttered with visible part and total duration of 1.318073 seconds. Picture of data spectrogram (3) covers three parts. The first part is in the form of spectrogram which showed picture of black and with lines which were tight and loose. The soundwave of first channel was 0.007811. The low scale of soundwave was 0.238 and height of soundwave was 0.2161. The soundwave of second channel was 0.004559. The low scale of soundwave was -0.238 and height of soundwave was 0.2161.

The second part covers two parts, pitch and intensity. Show pitch represented blue line which showed
the frequency. This part showed that Bu lama gak? was uttered in frequency of 128.8 Hz at final intonation. Meanwhile at the high frequency, the frequency was 500 Hz.

The third part is text grid which shows interrogative sentence on spectrogram in accordance with data (1). The part says interrogative sentence Bu lama gak? Text grid showed sentence based on soundwave at first part and second part.

In addition to spectrogram, there was also picture of intonation which went up and down. There was contour top in utterance Bu lama gak? The contour top was in word /gak/.

![Image of spectrogram](image1)

Figure 4. Contour of Bu lama gak?

Contour which went up and down in picture (4) was appearance of utterance Bu lama gak? There were two dots in intonation contour. These dots were primary contour and pre-contour. Intonation contour in data (2) as shown in picture (4) showed that initial dot of contour showed 25.0 Hz. The top of contour dot showed 403.4 Hz. The picture showed visible part and total duration of 1.328073 seconds. It means, sentence Bu lama gak? was uttered for 1.683787 seconds.

Pattern of sentence (1) was symbolized by 3 2 23#. Pattern of sentence (2) was symbolized by 2 22 3t#. The both sentences ended with high intonation. The up pressure on those sentence were located in the final word. Sentence (1) began with up intonation. Although both sentences used high intonation, the part which got pressure was in the end of the sentences. Both sentences required yes or no answer.

Sentence (1) – (2) had repetition of word [gak] and transformation (deletion) of word [enggak] into [gak].

[enggak] - [gak]

The word [enggak] which was uttered by autistic children means no. They said the word several times. It was shown on sentence (2) and previous declarative sentence which also contained word [enggak] or [gak].

There was transformation of sound of word [enggak] into [gak]. The transformation was derivation of Indonesian word [tidak] into [enggak]. The derivation of word [enggak] into [gak] happened due to the change of sound of the final syllable.

[8] says that derivation of word root such as the formation of basic word, repetitive word and compound word with unique structure inside is the process of iconizing. The word root which is icon of sound imitation is developed into wider icon. The icon development causes the shift of status of word root which is in the form of sound imitation or onomatope into another status.

In addition, there was also less complete pronunciation that was [d.: /ɹر]. Actually, the pronunciation should be [d.: /ɹr].

[dengar] - [denger]

[d.: /ɹr] - [d.: /ɹr]

[a] - [☆]

There was shift of sound of vocal [a] into [☆] on the second syllable. The vocal shift happened quickly when the children pronounced the word [dengar] with [denger]. The vocal shift happened due to phonetic similarity. It means, sound of [a] was similar to sound of [☆]. These two sounds were in the same row and in the same column.

(3) Bu Ika ikut?

2 2 3 2 3t#

The pattern of sentence (3) was symbolized by 22323t#. This sentence began with medium intonation and ended with high intonation. There was up pressure in the middle of the sentence. The pressure was on the word Ika, on the second syllable of word Ika precisely. The sentence contained subject and predicate.

The sentence was not only for expecting answer but also for expecting involvement of the respondent. [9] says that both declarative utterance and interrogative utterance in general have the meaning of order, invitation, prohibition and request.

Spectrogram of data (5) shows the energy which was used to say Bu Ika ikut? This picture also showed formant which was represented with dots which were connected to each other in straight or horizontal position. Below the dots, there was zigzag line. This line referred to slenderness which flowed up and down actively representing intensity which referred to the loudness of voice when the speaker said Bu Ika ikut?
Picture (5) showed utterance of *Bu lama gak?* which was uttered with visible part and total duration of 3.442979 seconds. Picture of spectrogram (5) covers three parts. The first part is in the form of spectrogram which showed picture of black and with lines which were tight and loose. The soundwave of first channel was -0.0044335. The low scale of soundwave was -0.07285 and height of soundwave was 0.1004. The soundwave of second channel was -0.0044335. The low scale of soundwave was -0.07285 and height of soundwave was 0.1004.

The second part covers two parts, pitch and intensity. Show pitch represented blue line which showed the frequency. This part showed that spectrogram (5) was uttered in high frequency that is 500 Hz. The lowest frequency was 75 Hz.

The third part is text grid which shows interrogative sentence on spectrogram in accordance with data of picture (5). The part says interrogative sentence *Bu Ika ikut?* Text grid showed sentence based on soundwave at first part and second part.

In addition to spectrogram, there was also picture of intonation which went up and down. There was contour top in utterance *Bu Ika ikut?* The contour top was in the middle of the sentence, in word Ika.

![Figure 6. Contour of Bu Ika ikut?](image)

Contour which went up and down was appearance of data of picture (6). There were two dots in intonation contour. These dots represented primary contour and pre-contour. Intonation contour in data (6) as shown in picture (6) showed that initial dot of contour showed 25.0 Hz. The top of contour dot showed 612.4 Hz. The picture showed visible part and total duration of 3.442979 seconds. It means, sentence *Bu Ika ikut?* was uttered for 3.442979 seconds.

(4) *Masih Ingat?*

2- 2##

The pattern of sentence (4) was symbolized by 2-2##. The sentence began and ended with flat intonation. Although this sentence ended with flat intonation, it represented interrogative sentence. The meaning of this sentence is that the speaker asked the respondent about something. The sentence consisted of basic words /masih/ and /ingat/.

![Figure 7. Spectrogram of Masih ingat?](image)

Spectrogram of data (7) shows the energy which was used to say *Masih ingat?* This picture also showed formant which was represented with dots which were connected to each other in straight or horizontal position. Below the dots, there was zigzag line. This line referred to slenderness which flowed up and down actively representing intensity which referred to the loudness of voice when the speaker said *Masih ingat?*

Picture (7) showed utterance of *Masih ingat?* which was uttered with visible part and total duration of 1.056848 seconds. Picture of spectrogram (7) covers three parts. The first part is in the form of spectrogram which showed picture of black and with lines which were tight and loose. The soundwave of first channel frequency was 0.0468. The low scale of soundwave was -0.2816 and height of soundwave was 0.2353. The soundwave of second channel was -0.04196. The low scale of soundwave was -0.2816 and height of soundwave was 0.2353.

The second part covers two parts, pitch and intensity. Show pitch represented blue line which showed the frequency. This part showed that data (4) was uttered in high frequency that is 500 Hz. The lowest frequency was 75 Hz.

The third part is text grid which shows interrogative sentence on spectrogram in accordance with data of picture (7). The part says interrogative sentence *Masih ingat?* Text grid showed sentence based on soundwave at first part and second part.

In addition to spectrogram, there was also picture of intonation which went up and down. There were two contour dots in utterance *Masih ingat?*

![Figure 8. Contour of Masih ingat?](image)

Contour which went up and down was appearance of data of picture (8). There were two dots in intonation.
contour. These dots represented primary contour and pre-contour. Intonation contour in data (8) as shown in picture (8) showed that initial dot of contour showed 25.0 Hz. The top of contour dot showed 300.0 Hz. The picture showed visible part and total duration of 1.056848 seconds. It means, *Masih ingat?* was uttered for 1.056848 seconds.

(5) *Lapangan boleh?*

2n2 2 2 3t#

Figure 9. Spectrogram of *Lapangan boleh?*

Spectrogram of data (9) shows the amount of energy which was used to say *Lapangan boleh?* This picture also showed formant which was represented with dots which were connected to each other in straight or horizontal position. Below the dots, there was zigzag lines. This line referred to slenderness which flowed up and down actively representing intensity which referred to the loudness of voice when the speaker *Lapangan boleh?*

Figure (9) showed utterance of *Lapangan boleh?* which was uttered with visible part and total duration of 1.187460 second. Figure of spectrogram (9) covers three parts. The first part is in the form of spectrogram which showed picture of black and with lines which were tight and loose. The soundwave with frequency was -0.005617. The low scale of soundwave was -0.007069 and height of soundwave 0.1224.

The second part covers two parts, pitch and intensity. Show pitch represented blue line which showed the frequency. This part showed that data (9) was uttered in frequency of 107.7 Hz at final intonation. The highest frequency was 500 Hz.

The third part is text grid which shows interrogative sentence on spectrogram in accordance with data of figure (9). The part says interrogative *Lapangan boleh?* Text grid showed sentence based on soundwave at first part and second part.

In addition to spectrogram, there was also picture of intonation which went up and down. There was contour top on utterance *Lapangan boleh?* The contour top was in the initial of the sentence, that is the word *lapangan.*

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**Table 2. Pattern of initial intonation of interrogative sentence with yes or no answer**

<table>
<thead>
<tr>
<th>Interrogative</th>
<th>Initial Intonation</th>
<th>Intonasi akhir</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gak denger apa?</td>
<td>3</td>
<td>apa? 23t#</td>
</tr>
<tr>
<td>Bu lama gak?</td>
<td>bu</td>
<td>gak? 3t#</td>
</tr>
<tr>
<td>Bu Ika ikut?</td>
<td>bu</td>
<td>iikut? 23t#</td>
</tr>
</tbody>
</table>

Contour which went up and down was appearance of data of figure (10). There were two dots in intonation contour. These dots represented primary contour and pre-contour. Intonation contour in data (10) as shown in figure (10) showed that initial dot of contour showed 25.0 Hz. The top of contour dot showed 300.0 Hz. The picture showed visible part and total duration of 1.0082971 seconds. It means, *Ke mana, di situ?* was uttered for 1.0082971 seconds.

The pattern of sentence (5) was symbolized with 2n22 23t#. The pattern of sentence (6) was symbolized with 223/223t#. The sentences began with medium intonation and ended with high pitch. Sentence (5) began with medium intonation and up tone. Meanwhile, sentence (6) contained high intonation which is pressure of the sentence. In addition to pressure, there was also pause after the high pressure. Both sentence (5) and sentence (6) ended with high intonation which means asking something to the respondent. The pattern of final intonation of sentence (5) and sentence (6) was 23t#.

Discourse markers whose function is to open or close a conversation or to mark transitions from one topic to another are most likely to be treated as separate intonation phrases. The same goes for those markers whose function is to make reference to shared knowledge between the speaker and the listener. Stance markers and hedges are often incorporated in the same intonation phrase unless the speaker feels the need to highlight a marker for some particular reason.

The meaning of intonation of interrogative sentence is not only asking something to the respondent. There is another topic which is expected by the speaker. In addition to question, this sentence can also contain yes, no answer, the answer but also action from the respondent or speaker. In imperative sentence with yes or no answer, the answer yes means confirmation to the sentence. Meanwhile, the answer no means denial or rejection of the sentence.
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Table 3. Pressure in interrogative sentences

<table>
<thead>
<tr>
<th>Interrogative Word</th>
<th>Initial Pressure Pattern</th>
<th>Middle Pressure Word Pattern</th>
<th>Final Pressure Word Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gak denger apa?</td>
<td>Gak 3 - -</td>
<td>apa? 23t#</td>
<td></td>
</tr>
<tr>
<td>Bu lama gak?</td>
<td>Bu - - -</td>
<td>gak? 3t#</td>
<td></td>
</tr>
<tr>
<td>Bu ika Lapangan boleh?</td>
<td>Ika 23 -</td>
<td>boleh 23t#</td>
<td></td>
</tr>
<tr>
<td>Ke mana, di mana, di situ?</td>
<td>2 23/ -</td>
<td>ke situ 2 23t#</td>
<td></td>
</tr>
</tbody>
</table>

Pattern of initial pressure in interrogative sentence with yes or no answer covered gak which is symbolized with 3 and ke mana which is symbolized with 223/. Pattern of middle pressure in interrogative sentence with yes or no answer covered ika which is symbolized with 23. Pattern of final pressure in interrogative sentence with yes or no answer covered apa which is symbolized with 23t#, gak which is symbolized with 3t#, ika which is symbolized with 23t#, boleh which is symbolized with 23t# and di situ which is symbolized with 223t#.

IV. CONCLUSION

The topic of sentence based on interrogative sentence which requires answer yes or no was adjusted to suit the condition of the children with autism. The utterance also can be just meaningless interrogative sentence. It means, the utterance was an interrogative sentence which came from chatter of children with autism. They were not really asking something. The sentences emerged naturally form their utterance. The interrogative sentence with yes or no answer came in the form of words combination which covered initial and final intonation. The intonation represented sentence’s topic which will be conveyed to the respondent.

The contour of intonation of interrogative sentence which contained combination of Indonesian words had contour top which was marked with contour dot. This is pressure of the sentence. Intonation contour was marked with high intonation and high pitch at the beginning, middle and end of the sentence.

The interrogative sentences contained pressure which was located at the beginning, middle and end of the sentence. The pressure was uttered with high intonation or high pitch. The pressure of interrogative sentence with yes or no answer is located the initial syllable or the final syllable. The children uttered interrogative sentence with raising pressure and high intonation. The pressure in interrogative sentence with yes or no answer was sentence’s topic which became main part of interrogative sentence.

REFERENCES